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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/705,486	11/10/2003	David Punsalan	200312536-1	5126

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EXAMINER	
WILKINS III, HARRY D	

ART UNIT	PAPER NUMBER
1742	

MAIL DATE	DELIVERY MODE
05/22/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/705,486	PUNSALAN ET AL.	
	Examiner	Art Unit	
	Harry D. Wilkins, III	1742	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *09 April 2007*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-18 and 53-72* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *17 and 64-72* is/are allowed.

6)☒ Claim(s) *1-16,18 and 53-63* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *10 November 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1-16, 18 and 53-63 are rejected under 35 U.S.C. 103(a) as being unpatentable over Honda et al (US 5,281,327) in view of Murphy et al (US 6,059,943) with evidence from Mesite et al (US 3,627,859).

Honda et al teach (see abstract, drawings and cols. 1-2) a method of forming a material including the steps of 1) removably coupling a perimeter support (2, 2') to a temporary substrate (3) and 2) electrodepositing a polymeric material film (6) on to the temporary substrate.

With respect to the recitation in the claim of "forming an electrolyte", this limitation relates to the intended use of the claimed method and is not given significant patentable weight. Further, Honda et al teach (see col. 3, lines 12-29) that the polymer of the resin layer included polymers polymerized from monomers such as vinylidene fluoride. Polyvinylidene fluoride was known to be effective as an electrolyte in fuel cells, as shown by Mesite et al (US 3,627,859).

Additionally, it is noted that although Applicant's disclosure describes the formed membrane becoming attached during formation to the perimeter support, this feature is not required by the claims.

Thus, Honda et al fail to teach depositing a combination of structural material (ceramic particles) and polymeric (electrolyte) material (including perfluorosulphonic acid, col. 8, lines 62-64) such that the electrodeposition included electrophoretic deposition to form an electrolyte *composite* film.

Murphy et al teach (see abstract, figure 12, col. 8, lines 35-44 and the paragraph spanning cols. 8 and 9) composite polymer (including polyvinylidene fluoride)-metal oxide membranes that are quite suitable for use as membranes for fuel cells, and reduced the dependence on water of the membrane.

Therefore, it would have been obvious to one of ordinary skill in the art to have utilized the method of making a polymeric film of Honda et al to make the polymeric-metal oxide composite membrane of Murphy et al because the process of Honda et al was capable of easily forming coherent polymer films and the composite membrane of Murphy et al reduced the dependence on water of the ion-exchange membrane.

The deposition of the metal oxide particles would have occurred by an electrophoretic mechanism.

Regarding claim 5, the perimeter support of Honda et al was a gasket.

Regarding claim 6, the temporary substrate of Honda et al was an electrode.

Regarding claim 7, Honda et al teach (see figure 1) that the temporary electrode was the negatively charged electrode.

Regarding claims 8-10, Honda et al teach (see col. 5, lines 37-47) using metallic material as the temporary substrate, particularly stainless steel.

Regarding claim 11, although Honda et al are silent with respect to using a

release material, since the film was to be separated from the temporary substrate, it would have been obvious to one of ordinary skill in the art to have provided a material that made the separation easier.

Regarding claims 13, 15 and 16, Honda et al teach (see col. 2, line 48 to col. 3, line 3) that two distinct layers were formed in the process. Since both layers formed by electrodeposition, the second layer (7) would have been formed by electrodeposition of ions.

Regarding claim 55, Murphy et al suggest (see Example 2) forming an anode and cathode on opposing sides of the electrolyte membrane to form a fuel cell.

Regarding claim 56, although Honda et al teach placing the temporary substrate in a solution, and then adding the monomer units, it would have been within the expected skill in the art to reverse the order by adding the monomer units to the solution prior to contact with the temporary substrate, with the expectation that the process would still proceed in the same manner.

Regarding claim 57, as discussed above, the materials utilized by Murphy et al included materials suitable for use as electrolytes in fuel cells.

Regarding claim 58, Murphy et al suggests (see paragraph spanning cols. 8 and 9) using perfluorosulphonic acid as the polymer membrane.

Regarding claim 59, Murphy et al suggests adding ceramic particles to the solution to form an electrolyte composite film.

Regarding claim 60, Honda et al discloses disposing a perimeter support on the temporary substrate as claimed.

Regarding claim 61, although Honda et al are silent with respect to using a release material, since the film was to be separated from the temporary substrate, it would have been obvious to one of ordinary skill in the art to have provided a material that made the separation easier.

Regarding claims 62 and 63, Honda et al teach a second depositing step by electrolytic polymerization of monomer units from solution, wherein the monomer units included at least one functional group including halogen atoms and alkylsulfonic groups. Perfluorosulfuonate ionomers contained halogen atoms and sulfonic groups.

Allowable Subject Matter

3. Claims 17 and 64-72 are allowed.

4. The following is a statement of reasons for the indication of allowable subject matter: the prior art does not teach or suggest formation of a polymeric film with use of a perimeter support (gasket) wherein the film becomes attached to the support such that both are removed from a temporary substrate as an integral unit.

Response to Arguments

5. Applicant's arguments filed 9 April 2007 have been fully considered but they are not persuasive. Applicant has argued that:

a. The claims are limited to "electrolyte", which Cressman et al does not teach.

In response, Applicant defines, in paragraph 17, "electrolyte" to mean a substance, either solid or liquid, that will provide ionic conductivity when dissolved in water or when in contact with it. The ethylene glycol dimethacrylate polymer taught by

Cressman et al has been utilized in fuel cell membranes (see WO 2003/081707, and its US equivalent US 2004/0209155), thus, it should be construed as an "electrolyte" as defined by Applicant, because it possessed at least some ability to provide ionic conductivity.

However, Applicant's argument, with respect to the present claims requiring an "electrolyte composite film", filed 9 April 2007, with respect to Cressman et al has been fully considered and is persuasive because the specification generally teaches that the claimed electrolyte composite film included both the polymeric material and a structural reinforcing agent, such as the ceramic particles of claim 4. The rejection of claims 1 and 5-7 based on Cressman et al alone has been withdrawn.

b. Honda et al fails to teach that the polymer deposited was an electrolyte.

In response, as noted in the rejection grounds above, Applicant defines, in paragraph 17, "electrolyte" to mean a substance, either solid or liquid, that will provide ionic conductivity when dissolved in water or when in contact with it. Honda et al disclose polyvinylidene fluoride monomers for forming the polymeric film. It was known in the prior art the such a polymer provided ionic conductivity when in contact with water.

However, Applicant's argument, with respect to the present claims requiring an "electrolyte composite film", filed 9 April 2007, with respect to Honda et al alone has been fully considered and is persuasive because the specification generally teaches that the claimed electrolyte composite film included both the polymeric material and a

structural reinforcing agent, such as the ceramic particles of claim 4. The rejection of claims 1 and 5-7 based on Honda et al alone has been withdrawn.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Harry D. Wilkins, III whose telephone number is 571-272-1251. The examiner can normally be reached on M-F 8:30am-5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Roy V. King can be reached on 571-272-1244. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Harry D Wilkins, III
Primary Examiner
Art Unit 1742

hdw